

SYSTEM AND METHOD FOR PROVIDING
AN AUTOMATIC TELEPHONE CALL BACK TO A TELEPHONE LINE
BEING USED TO ACCESS A COMPUTER NETWORK

FIELD OF THE INVENTION

The present invention relates to telephony systems and more particularly, to a system and method for providing an automatic telephone call back to a telephone line being used to access a computer network.

BACKGROUND OF THE INVENTION

Telephony call centers which place outbound calls and receive inbound calls (often called call campaigns) typically utilize a telephone call center management system to help automate much of the process. The telephone call center management system controls, among other functions, the dialing of outbound telephone numbers from a predefined, sorted call list having a number of customer call records within each call list. These customer call lists may be downloaded from a call record source, such as a host computer, to the telephone call center management system once during a 24 hour period, often during the non-busy early hours of the morning, or may be continuously and dynamically downloaded for dynamic updating of call records within a call list. The telephone call center management system automatically connects

1 outbound calls and inbound calls to available operators or agents
2 for handling.

3 In the past, the overwhelming majority of customers or
4 potential customers (collectively "inquiring parties") contacted
5 the call center by telephone to obtain information. These
6 inquiring parties may be calling for many different reasons. For
7 example, the inquiring parties may want information on the
8 company's products or services, or may want information on their
9 existing account with the company. Often there are no agents
10 available at the company to provide the requested information, and
11 the inquiring party must wait on hold for an available agent,
12 receive the information by way of recorded messages, or call back
13 at another time.

14 With the advent of global or large scale computer networks
15 such as the Internet (also known as the World Wide Web), it is now
16 possible for companies to provide information "on-line" that is
17 accessible by its customers or potential customers via a data
18 terminal (e.g. a PC) connected to the network. A company may
19 provide "on-line" information about products and/or services that
20 might be of interest to an inquiring party, as well as information
21 on the status of a party's account. One way of providing on-line
22 information is with hypertext documents on the World Wide Web
23 created using Hypertext Markup Language (HTML). By browsing
24 through these "web pages" using the data terminal, the inquiring

1 party can obtain information in the form of text, graphics and/or
2 sound.

3 Although the Internet or other such computer network provides
4 an additional medium for communicating information to inquiring
5 parties, a party may still want assistance from a "live" agent.
6 Some "web pages" allow inquiring parties to request a call back by
7 including a field for the inquiring party to provide a telephone
8 number or other such information related to contacting the party
9 with a "live" agent. These requests are typically transmitted to
10 the company, for example, in the form of electronic mail and
11 stored in a file. The telephone numbers and other relevant
12 information are then manually entered into an existing telephone
13 call center management system. The call back is then made at a
14 later, less convenient time using the existing telephony system,
15 e.g., by having an agent manually call back or by automatically
16 calling back and placing the party on hold to wait for an
17 available agent. If the inquiring party needs assistance, e.g.,
18 with an account, a product/service, or the like, the existing
19 systems are unable to provide that assistance at the time
20 requested by the inquiring party.

21 An immediate call back is often the ideal time for responding
22 to a request by the inquiring party. The inquiring party is
23 interested in this particular product, service, or information at
24 the moment the request is made and is likely to be proximate to a

1 telephone. Providing an immediate connection to an agent,
2 however, presents an additional problem. One common way to
3 connect to the Internet / World Wide Web is by using a PC with a
4 modem that dials in to an Internet Service Provider (ISP) over the
5 Public Switched Telephone Network (PSTN). If the only available
6 telephone line is being used for connecting to the network, an
7 immediate call back may not be possible since the inquiring party
8 is likely to still be connected to the network (i.e., "on-line")
9 when the attempted call back is made. When dialing outbound
10 calls, existing telephony systems will typically treat a busy
11 signal as a failed attempt and will schedule a recall at a later
12 point in time. Thus, the inquiring party will not receive the
13 assistance as soon as possible after the request has been made.

14 As the usage of the Internet and other global computer
15 networks increases, an increasing number of individuals will want
16 to use this medium of communication to contact companies for
17 requesting information. Existing telephone call center management
18 systems are not integrated with global computer networks in a
19 manner that allows a company to automatically and efficiently
20 respond to requests made over the global computer network by
21 inquiring parties with call backs at the most convenient time.

22 Accordingly, what is needed is an system and method for
23 providing an automatic and immediate telephone call back to an
24 inquiring party who has provided information to a company from a

1 data terminal connected across a computer network. What is also
2 needed is an automatic call back system and method capable of
3 connecting to the inquiring party even if the inquiring party is
4 using the only available telephone line to access the computer
5 network.

6 SUMMARY OF THE INVENTION

7 The present invention features a system and method for
8 providing a telephone call back to a telephone line that is being
9 used to access a computer network. The call back is made based
10 upon a request transmitted over the computer network from a data
11 terminal located at a remote location and connected to the
12 computer network using the telephone line. The request includes
13 call back data including at least a telephone number to be called.

14 The system comprises; a computer network interface, connected
15 to the computer network, for interfacing with the computer network
16 and receiving the request over the computer network, for
17 identifying the call back data, and for storing the call back data
18 including the telephone number in a call back file; and an
19 automated dialer system, responsive to the call back file. The
20 automated dialer system includes a call back campaign manager,
21 for retrieving the telephone numbers in the call back file; a
22 call scheduler, responsive to the call back campaign manager, for
23 scheduling at least one of the telephone numbers for immediate

1 dialing; a predictive dialer, responsive to the ordered telephone
2 numbers, for initiating dialing of each of the ordered telephone
3 numbers as scheduled over telephone lines, for monitoring a
4 status of the telephone lines, and for connecting an answered
5 call to a telephone of an available agent coupled to the
6 automated dialer system; and a re-dial script, responsive to the
7 call back campaign manager, for directing the predictive dialer
8 to redial a busy telephone number when the predictive dialer
9 detects a busy signal after dialing the busy telephone number.

10 The method comprises the steps of: receiving the request
11 transmitted from the terminal at the remote location; identifying
12 the call back data including at least one telephone number to be
13 dialed; placing the call back data into a call back file;
14 retrieving telephone numbers to be dialed from the call back file;
15 scheduling at least one of the telephone numbers for immediate
16 dialing; automatically dialing the telephone number scheduled for
17 immediate dialing over a telephone line; monitoring the telephone
18 line to detect a busy signal; and redialing the telephone number
19 when the busy signal is detected.

20 The preferred method continuously redials the busy telephone
21 numbers until an answer is detected. When an answer is detected,
22 the method connects the telephone line to an available agent. If
23 no connection is made, the method adds the unanswered telephone
24 numbers to a further call campaign.

1 BRIEF DESCRIPTION OF THE DRAWINGS

2 These and other features and advantages of the present
3 invention will be better understood by reading the following
4 detailed description, taken together with the drawings wherein:

5 FIG. 1 is a schematic block diagram of an automated telephone
6 call back system used with the global computer network and
7 telephone network, according to the present invention;

8 FIG. 2 is a schematic block diagram of the automated
9 telephone call back system, according the present invention; and

10 FIG. 3 is a flow chart illustrating the method of providing
11 an automatic call back, according to the present invention.

12 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

13 The automated telephone call back system 10, FIG. 1,
14 according to the present invention, provides an automatic
15 telephone call back to an inquiring party (e.g. a customer or
16 potential customer) who has requested assistance from a "live"
17 agent 12a-12c at a call center in a company or other organization.
18 The request is typically made from a remote location 14 by way of
19 a terminal 16, such as a PC, connected to a computer network 20,
20 such as the Internet / World Wide Web. The remote location 14
21 also typically includes a telephone 18 for receiving the call
22 back, as will be described in greater detail below.

1 In the exemplary embodiment, the terminal 16 at the remote
2 location 14 is connected to the computer network 20 (e.g., the
3 Internet / World Wide Web) using a telephone network 22. To
4 establish the connection to the computer network 20 using the
5 telephone network 22, the computer terminal 16 at the remote
6 location 14, such as the inquiring party's residence, uses a modem
7 24 connected to a telephone line 26 into the telephone network 22.
8 The modem 24 can be connected directly to the telephone line 26 or
9 can be connected through the telephone 18 at the location 14. The
10 computer terminal 16 accesses the computer network 20 by using the
11 modem 24 to dial in to a computer network server 28, for example,
12 an internet server maintained by an Internet Service Provider
13 (ISP), which provides an interface between the telephone network
14 22 and the computer network 20. The present invention
15 contemplates other types of "dial-up" connections to the computer
16 network using, for example, Integrated Services Digital Network
17 (ISDN), a cellular telephone network, or other alternatives to
18 conventional telephone connections.

19 For a "dial up" type connection, the same telephone line 26
20 is often used by both the telephone 18 to receive calls and the
21 computer terminal 16 to access the computer network 20. Thus, the
22 telephone line 26 may not be available for a call back to the
23 telephone 18 if the telephone line 26 is still in use to access
24 the computer network 20. The present invention provides a system

1 and method for connecting to the telephone 18 over the telephone
2 line 26 when the same telephone line 26 is used both for the
3 telephone 18 and the terminal 16, as will be described in greater
4 detail below.

5 The inquiring party typically makes the request after making
6 an initial inquiry for information, such as product/service or
7 customer account information. This information is typically
8 provided by an information server 30 accessed by the inquiring
9 party at the remote location 14 by way of the terminal 16
10 connected to the computer network 20. The request data is
11 transmitted over the computer network 20 to the automated
12 telephone call back system 10 either directly or by way of the
13 information server 30. The automated telephone call back system
14 10 processes the request and schedules a call back immediately
15 following the request or at a preferred time specified by the
16 inquiring party.

17 In the exemplary embodiment, the computer network 20 is the
18 Internet / World Wide Web, although the present invention
19 contemplates other types of computer networks that are accessed by
20 "dial up" connections over the telephone line 26. In the
21 exemplary embodiment, the information server 30 is a web server
22 that presents the information in the form of "web pages" including
23 on-line forms for entry of data pertaining to the request (e.g.,
24 telephone number, name, account number). In this example, the

1 information server 30 includes a computer that generates hypertext
2 documents using Hypertext Markup Language (HTML) containing the
3 information to be accessed by the inquiring party. The computer
4 terminal 16 is used by the inquiring party to access the
5 information and includes a user interface to display the hypertext
6 documents or "web pages" provided by the information server 20 in
7 the form of text, graphics, pictures, audio, and data (text) entry
8 fields.

9 If assistance is needed from a live agent, a document is
10 provided by the information server 30 that includes a data entry
11 form requesting the data necessary to make a call back for
12 assistance, e.g. name, telephone number, address, account number,
13 a type of product/service, and the like. The data is then
14 transmitted from the computer terminal 16 to the automated
15 telephone call back system 10 over the computer network 20. The
16 creation of data entry fields and the transmission of the entered
17 data to the automated telephone call back system can be performed
18 by a Common Gateway Interface (CGI) script that runs on the server
19 30 or a JAVA language program that runs on the computer terminal
20 16. The automated call back system 10 processes the request, and
21 based upon the request data, a call back can be made to the
22 telephone 18 at the location 14 or any other telephone number
23 specified by the inquiring party. In addition to computer
24 terminal 16, the present invention contemplates other devices

1 capable of receiving and transmitting information over the
2 Internet / World Wide Web or other computer networks.

3 According to the preferred embodiment, the automated
4 telephone call back system 10, Fig. 2, includes an automated
5 dialer system 40, for processing outbound call campaigns, and a
6 computer network interface 42, for providing an interface or
7 gateway between the automated dialer system 40 and the computer
8 network 20 over which the call back request is made. According to
9 one example, the automated dialer system 40 is implemented as part
10 of a telephony system, such as the type sold under the name
UNISON® by Davox Corporation, Westford, Mass. This type of
11 telephony system is disclosed in greater detail in U.S. Patent No.
12 5,592,543 issued January 7, 1997, assigned to the assignee of the
13 present application and incorporated herein by reference. In the
14 telephony system, the agents 12a-12c each have a headset 43a-43c
15 or other voice processing device and a computer terminal 41a-41c
16 or other type of data input/output device connected to the
17 automated dialer system 10. The computer network interface 42,
18 the automated dialer system 40, the agent terminals 41a-41c, and
19 other components of the system 10 are connected with a data path
20 44, such as an ethernet network.

21
22 The computer network interface 42 receives the call back data
23 and other inquiring party data transmitted over the computer
24 network 20, creates a call back record 46 and routes the call back

1 record 46 (e.g., telephone number, and time to call) to a call
2 manager. The call back records 46 can be dynamically created and
3 sent to the call campaign manager 50 as call back requests are
4 received by the computer network interface 42. One example of a
5 system that dynamically updates call records in a call list is
6 disclosed in greater detail in U.S. Patent Application Serial No.
7 08/635,028 (Attorney Docket No. Davox-138XX) filed April 19,
8 1996, assigned to the assignee of the present invention and
9 incorporated herein by reference. Other data pertaining to the
10 inquiring party (e.g., name, address, account number,
11 products/services of interest), may be stored in an inquiring
12 party database 48. If the inquiring party has been previously
13 contacted (e.g., an existing customer), additional data may be
14 downloaded to the inquiring party database 48 from a host (not
15 shown) coupled to the automated dialer system 40.

16 The automated dialer system 40 then processes the call
17 records 46 as an outgoing telephone call campaign. The call
18 campaign manager 50 manages the outbound dialing of the telephone
19 numbers in the call back records 46. The automated dialer system
20 40 also includes a predictive dialer 52 that automatically dials
21 the telephone numbers within the call records 46 over one of the
22 telephone (trunk) lines 54. When an answer is detected, the call
23 is connected to a headset 43a-43c of the available agent, and
24 information pertaining to the called party can be routed by the

1 automated dialer system 40 from the inquiring party database 48 to
2 the terminal 41a-41c of the available agent.

3 In the preferred embodiment, the automated dialer system 40
4 further includes a call scheduler 56, responsive to the call
5 campaign manager 50, for determining the optimum time to call each
6 of the numbers and for arranging the call records 46 accordingly.
7 One type of call scheduler 56 is typically implemented as a
8 software program and is described in greater detail in U.S. Patent
9 Application No. 08/699,292 entitled "Call Record Scheduling System
10 And Method" assigned to the assignee of the present invention and
11 incorporated herein by reference. The call scheduler 56 will
12 prioritize the call records based upon call back data specified by
13 the inquiring party. If immediate call back is requested or if no
14 call back time is specified, the call records are repeatedly
15 called upon until no longer busy since the inquiring party is
16 likely to be proximate to the telephone.

17 The automated dialer system 40 also includes a dial script
18 58, responsive to the call campaign manager 50, for controlling
19 the dialing of the telephone numbers in the call file 46 when a
20 busy signal is received. The dial script 58, also referred to as
21 a telephony application client (TAC), is typically implemented as
22 a software program. Examples of TACs used in outbound dialing are
23 disclosed in U.S. Patent Application Serial No. 08/252,338
24 entitled "Universal Telephony Application Client", assigned to the

1 assignee of the present application and incorporated herein by
2 reference. The call campaign manager 50 initiates the dial script
3 58 when the call scheduler 56 schedules call backs for immediate
4 dialing.

5 The predictive dialer 52 preferably includes a call status
6 monitor 60 that monitors the status of the call progress signals
7 on the telephone lines 54. The dial script 58 is responsive to
8 the call status monitor 60, and when a busy signal is detected by
9 the call status monitor 60, the dial script 58 directs the
10 predictive dialer 52 to immediately (or within a short period such
11 as one minute) re-dial the busy telephone number. The dial script
12 58 thus causes immediate call backs to be continuously re-dialed
13 when a busy signal is detected, allowing a call back to be made as
14 soon as possible after a party disconnects from the computer
15 network 20

16 The predictive dialer 52 preferably utilizes a call pacing
17 algorithm which is designed to optimize the time utilization by
18 the telephone call agents. A description of one type of
19 predictive dialer and call pacing algorithm is disclosed in U.S.
20 Patent No. 5,295,184 assigned to the assignee of the present
21 application and incorporated herein by reference. The predictive
22 dialer 52 controls the automatic dialing of the call back numbers
23 as well as the dialing of numbers in other active outbound
24 campaigns to minimize the amount of time a called party will have

1 to spend on hold.

2 The automatic telephone call back method 300, Fig. 3,
3 according to the present invention, begins when the computer
4 network interface 42 of the automated telephone call back system
5 40 receives a request for assistance from an agent, step 312. The
6 call back data (e.g., the telephone numbers to be dialed and call
7 back time) is identified by the computer network interface 42,
8 step 314, and formatted into call back records 46, step 316. The
9 call back records 46 are sent to the automated dialer system 40
10 and are batched into a call back list, step 318, and, based upon
11 other call back data transmitted by the inquiring party,
12 determines the most convenient time for a call back and schedules
13 the call backs accordingly, step 320. Unless the inquiring party
14 specifies a different time, an immediate call back will be
15 scheduled, since the inquiring party is likely to be proximate the
16 telephone.

17 The telephone numbers scheduled for immediate call back are
18 then immediately and automatically dialed, step 322. The
19 telephone lines 54 over which the call is being made are monitored
20 to determine whether a connection is made, step 324. If a busy
21 signal is detected, step 326, the dial script 58 instructs the
22 dialer 52 to re-dial the number, step 328. The dialer 52
23 continuously re-dials the number, until an answer is detected,
24 step 330, or until a determination is made that callee is no

1 longer there (ring no answer, or answer machine detected), step
2 332, and the call is aborted or rescheduled for later or the end
3 of campaign is reached (all agents logged off).

4 When an answer is detected 330, the inquiring party is
5 connected to an available agent, step 334, by transferring the
6 voice to the agent's telephone 43a-43c and by transferring any
7 other relevant data pertaining to the called party to the agent's
8 terminal 41a-41c. If no connection is made, the telephone number
9 is scheduled to be called at a later time in a future call
10 campaign, step 336.

11 Accordingly, the automated telephone call back system of the
12 present invention provides an automatic call back to an inquiring
13 party (e.g., customer or potential customer) in response to a
14 request made by the inquiring party while accessing information
15 over a computer network using a telephone line. The automated
16 dialer system has the capacity to efficiently process the call
17 backs by scheduling the calls as the most convenient time (e.g.
18 immediately or at another time specified by the called party), by
19 automatically dialing, and by pacing the calls so that an agent
20 capable of handling the call will be immediately available when a
21 connection is made. Moreover, if the inquiring party makes the
22 request while connected to a computer network using the only
23 available telephone line, the present invention is capable of
24 contacting the inquiring party as soon as possible after the

1 inquiring party has disconnected and the telephone line becomes
2 available.

3 Modifications and substitutions by one of ordinary skills in
4 the art are considered to be within the scope of the present
5 invention which is not to be limited except by the claims which
6 follow.

7 What is claimed is:

005749-04098
866040-6425060